CLAIMS

1. In a method for obtaining viable chondrocytes capable of being used for transplantation comprising surgically obtaining cartilaginous tissue from the knee, nose or ankle and obtaining chondrocytes from said tissue wherein said chondrocytes are capable of being used for cell transplantation or for the preparation of chondrocyte containing scaffolds.

2. A method of producing abundant quantities of good quality chondrocytes comprising expanding said chondrocytes in spin culture and then culturing said chondrocytes in a controlled strain apparatus, thereby obtaining abundant quantities of good quality chondrocytes.

3. Chondrocytes or cells capable of becoming chondrocytes cultured on specially prepared chitosan containing scaffolds.

4. A polymer composition useful for preparing a scaffold comprising a gel prepared from the reaction of dialdehyde arabinogalactan and chitosan.

5. A method of surgical repair using chondrocytes comprising the steps of (a) obtaining cartilage from the knee, nose or ankle (b) separating chondrocytes from said cartilage,

(c) culturing said chondrocytes on microcarriers under spin-culture conditions to enhance integrin expression.

6. The method of surgical repair of claim 5 wherein the chondrocytes are cultured on collagen microcarriers.

7. The method of surgical repair of claim 5 wherein the chondrocytes are expanded on microcarriers in suspension culture and then subjected to cyclic strain in order to cause the increased synthesis of β_1 integrin in chondrocytes and thereby produce chondrocytes which are more effective for use in cartilage repair.

8. The surgical method of claim 5 further comprising separating the chondrocytes form the microcarrier and culture in the chondrocytes on a chitosan scaffold which can be used for cartilage repair.

9. The surgical method of claim 5 further comprising separating the chondrocytes form the microcarrier and culturing the chondrocytes on an arabinogalactan-chitosan polymer scaffold which can be used for cartilage repair.

10. A tissue-engineered replacement body part for a patient, wherein the cells from which the body part have been grown, at least initially in the laboratory, are from cells of a sample obtained from tissue of the patient, and wherein the said cells of the body part

have been grown in suspension culture on microcarriers in a low oxygen concentration environment.

11. The tissue-engineered replacement body part of claim 10, further including a biodegradable scaffolding for preparing the body part.

12. The tissue-engineered replacement body part of claim 11, wherein a sample tissue to obtain the cells are taken from the patient's nasal septum.

13. A tissue-engineered replacement body part for a patient, wherein the cells to prepare the body part have been grown at least initially in the laboratory from a sample tissue obtained from the patient's nasal septum.

14. The tissue-engineered replacement body part of claim 13, wherein the part is a replacement for cartilage.

15. The tissue-engineered replacement body part of claim 14, further including a biodegradable polymer scaffolding for preparing the replacement cartilage.

16. The tissue-engineered replacement body part of claim 15, wherein the cells for producing the body part have been grown in a suspension culture.

17. The tissue-engineered replacement body part of claim 16, wherein the cells of the body part have also been grown in an environment of reduced oxygen.

18. The method of replacing a tissue or body part or filling a void in head and neck surgery, comprising the steps of obtaining a non-diseased, cell sample from the respective patient's head and neck area, rapidly growing such cells in a bioreactor and within a mold in which the mirror image of the patient's tissue, body part or void is produced, and surgically implanting the molded tissue or body part as a replacement in the patient's head and neck area, such that the molded tissue or body part replaces the missing tissue or regenerates therein and fuses with the adjacent tissues in the head and neck area of the respective patient.

19. The method of claim 18, wherein the cell sample is obtained from the respective patient's nasal septum.

20. The method of claim 19 wherein the cells obtained are chondrocytes.

21. The method of claim 18 further including a scaffold made from a bio-degradable polymer for supporting the molded tissue or body part.

22. A method of surgical repair employing cells capable of becoming chondrocytes comprising culturing said cells on microcarries under suspension culture to enhance integrin expression.

23. The method of surgical repair wherein chondrocytes or cells capable of becoming chondrocytes are expended on microcarries in suspension culture and then subjected to cylic strain in order to cause the increased synthesis of β, integrin and to make said chondrocytes or cells capable of becoming chondrocytes more effective for use in cartilage repair.

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